SHURE

PRO MASTER™

Model 700 Power Console Instruction Manual

PRO MASTER™

The Features...
you find most useful... stereo... pre-fader monitor... two power amps... exclusive FEEDBACK FINDER™ and PATCH BLOCK™

The Reliability...
you need for demanding, continuous operation

The Quality...
you've come to expect from Shure

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WARNING
To prevent a source of fire or electric shock, do not expose this appliance to rain or extreme moisture.

Introducing the Shure PRO MASTER™ Power Console Model 700

. . . a portable, high-power, stereo, 8-input mixer-amplifier with the flexibility and dependability demanded by professional entertainers and sound system operators. The result of years of design concept study and evaluation, the PRO MASTER handles any sound job well—even those grueling tours where daily setups and "knockdowns" punish equipment severely.

The PRO MASTER is an all solid-state unit, employing the latest developments in highly reliable integrated circuit, discrete component, and printed wiring technology. It's easy to set up and operate—no separate power amps, equalizers or reverb are required. And connecting accessory equipment is fast and convenient.

The PRO MASTER is full of features for super performance and super convenience—the unique FEEDBACK FINDER™ helps maximize gain before feedback, makes feedback location and suppression fast and easy . . . exclusive PATCH BLOCK™ rear panel shows you where you're patching, helps you construct complex circuits using simple patch cords . . . efficient "wind tunnel" power amp design has temperature warning and shutdown LED indicators.

Its versatile control panel is human-engineered for ease of operation in daylight or the darkest, smoke-filled clubs. And it's packaged in a handsome, rugged, lightweight, molded ARMO-DUR™ case complete with carrying handle and line cord storage.

The PRO MASTER offers you the best of all worlds—quality sound for small, intimate clubs, churches and schools, or large auditoriums. In combination with Shure's PRO MASTER Speaker Systems, you've got a sound reinforcement system that's ideal for every application. Need more capability? The PRO MASTER is super-expandable—use accessory mixers or power amps, stage monitor speakers, effects devices, whatever you need can easily be added. And it's all backed by Shure's traditional quality and reliability. It's the sound you need . . . when you need it . . . and where you need it.

Just look at these features—

- Completely stereo
- Twin full 200-watt power amplifiers
- Six high-impedance and six balanced low-impedance mic inputs *plus* two aux inputs *plus* A/B EQ and PA (power amp) inputs
- Six input channels for microphones and aux level sources with full controls: volume, attenuation, A/B pan, frequency equalization, effects/reverb, and monitor
- High- and low-impedance inputs may be used simultaneously
- Two additional aux channels with volume and A/B pan controls
- Full master controls: monitor, A volume, B volume, effects send, reverb return, and reverb high- and low-frequency equalization
- Outputs for all needs: monitor, effects, stereo headphones, A+B aux, A+B mic, and A and B speakers (2 each)
- Four common mix buses: A and B mix output, and A and B equalizer output
- Balanced mono (A+B sum) mic output for "house" systems
- Record in stereo with mono performance and separate mono stage monitor
- Unique FEEDBACK FINDER with LED readout instantly identifies feedback frequency bands
- Twin 10-band graphic equalizers with minimum phase, combining-type filters. Lowest filter is −12 dB/octave cut-only switch; others are ± 13 dB adjustable
- Exclusive PATCH BLOCK rear panel shows you where to patch—jacks are located right in the block diagram
- Built-in reverb unit with provisions for external on/off switching and external effects devices
- Regulated 24 Vdc simplex supply for powering condenser microphones
- Bright red LED indicators show input clipping, power amp peak output level, power amp overload, power-on, temperature warning, and shutdown
- Protected against damage from open- or short-circuits on inputs or outputs
- Protected against heat damage by ultra-reliable cooling fan and automatic thermal shutdown circuit
- Protected against radio frequency interference and line noise
- Operates on as low as 100 Vac (at reduced output)
- Rugged molded ARMO-DUR case with carrying handle and line cord storage
- Listed by Underwriters' Laboratories, Inc.; listed by Canadian Standards Association as certified

Controls • Connectors • Indicators

1 Input Channels (Orange marks on controls indicate basic or initial settings)

Basically...

MONITOR
Independently controls channel monitor level to monitor output. Adjust for desired monitor mix when using a monitor system.

EFFECTS/REVERB
Controls amount of reverberation and/or external effects on channel. Adjust for desired amount (use low settings for vocals, higher settings for instruments).

HI FREQ EQ
Sets channel treble boost or cut for desired tone shaping.

LO FREQ EQ
Sets channel bass boost or cut for desired tone shaping.

A/B PAN
Used for stereo (left-right) positioning in stereo sound reinforcement or recording. Position straight up for center (monophonic) sound reinforcement use.

INPUT CLIP
Indicates when input signal is too high. Adjust INPUT ATTEN until only occasional flashes are noted.

INPUT ATTEN
Adjusts input attenuation for channel. Suggested initial settings: condenser microphones or amplified instruments −12 to −30; normal vocals −6 to −12; loud vocals −12 to −24; distant miking 0.

VOLUME
Allows individual setting of channel input for desired signal mix. If setting is consistently low (1 or 2), or high (8 to 10), adjust INPUT ATTEN.

In addition...

MONITOR
Control precedes VOLUME ("pre-fader") and other channel controls; not affected by VOLUME, EQualizers, EFFECTS/REVERB, or A/B PAN. Only affected by INPUT ATTEN, allowing totally independent monitor mix.

EFFECTS/REVERB
This channel send control follows the INPUT ATTEN, VOLUME and EQ controls. Can be used simultaneously with reverb and external effects devices, or as a second monitor ("post-fader") to the EFFECTS OUTPUT jack.

HI FREQ EQ
Adjusts channel ± 13 dB at 10 kHz on A and B outputs and effects output; does not affect monitor output.

LO FREQ EQ
Adjusts channel ± 13 dB at 100 Hz on A and B outputs and effects output; does not affect monitor output.

A/B PAN
Used for stereo positioning; allows assignment of channel signal to both A and B (straight up) or only A or B output channel (full counterclockwise or clockwise), or any position between.

INPUT CLIP
Lights approximately 3 dB prior to clipping of preamp *or* input channel equalizer. For optimum signal-to-noise ratio, adjust INPUT ATTEN for *occasional* flashes (no light may mean noisy operation; constant light means distortion).

INPUT ATTEN
Adjusts gain of preamplifier to permit channel to accept microphone level signals, direct instrument pickups, or high level aux signals from amplified instruments or tape recorders; almost any input device can be accommodated.

VOLUME
Affects all A and B outputs plus A+B outputs and effects/reverb level; does not affect monitor mix.

2 Inputs:

Both inputs may be used at the same time with similar microphones (one high and one low impedance), allowing up to 12 microphones simultaneously.

HI IMP
Provides for connection of high-impedance microphones, direct instrument pickups, keyboards, amplified instruments, tape recorders or other high-level sources to channel input.

BAL LO IMP
Provides for connection of low-impedance dynamic, ribbon or condenser microphones and other low-level inputs to channel input. (Don't use when high-level source is used on HI IMP input.)

HI IMP
Can be used with line matching transformer (Shure A95FP) to allow two low-impedance microphones on channel (not recommended for two condenser microphones).

BAL LO IMP
Also may be used to power most condenser microphones such as the Shure SM81; built-in +24 Vdc simplex power supply voltage activated by rear-panel switch.

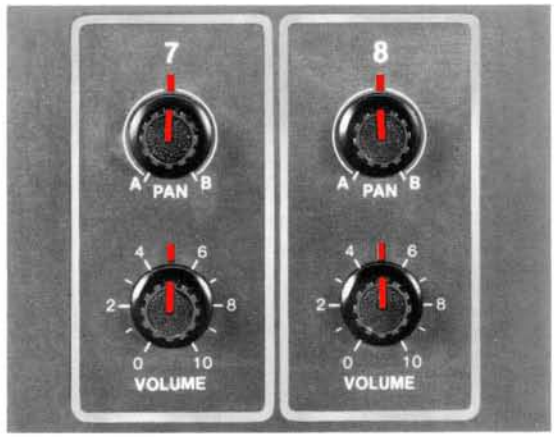
3 Aux Inputs

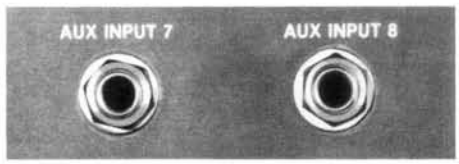
Channels 7 and 8 are aux level inputs, providing additional input capabilities for tape recorders, synthesizers, amplified instruments, background music sources, preamplified phonographs, or other mixers. These channels have A/B PAN controls for stereo positioning, VOLUME controls for setting the channel input mix level, and AUX INPUT phone jacks. To play a stereo tape, connect the left tape channel to AUX INPUT 7 and set the channel 7 PAN control to A (full counterclockwise). Connect the right tape channel to AUX INPUT 8 and set the channel 8 PAN control to B (full clockwise). If equalization, reverb/effects and monitor are desired, use two of the first six input channels with proper input attenuation.

These inputs can also be used for the return signal from an external effects device (delay, echo, etc.) driven by the EFFECTS OUTPUT.

When an additional mixer (such as the Shure M68, M67 or SR101) is connected to channel 7 or 8, the aux channel volume control becomes a submaster control.

The orange control marks indicate basic or initial settings.



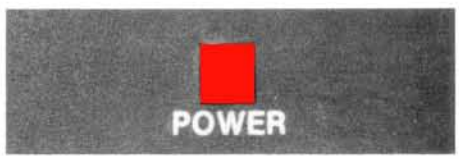


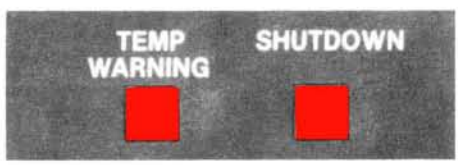
4 LED Status Indicators

POWER—Indicates application of ac voltage to power supply when rear-panel ON-OFF switch is turned on.

TEMP WARNING—Lights when unusually high temperature of 70°C (158°F) is reached on the output transistors. Indication may be due to blockage of air louvers, dirty air filter, or operating the console at a high output level with a low load impedance (too many speakers or a short-circuited output). Indicator will turn off when transistor case temperature drops below 70°C. If indicator lights, it is advisable to identify the cause and make corrections to avoid shutdown.

SHUTDOWN—When indicator is on, both power amplifiers are turned off (all other circuits remain on). The console may shut down for one of the following reasons: (1) excessive temperature due to inadequate cooling (see TEMP WARNING), (2) dc voltage on speaker lines due to power transistor failure (check for this condition by turning the console off, waiting several minutes, and turning it back on), or (3) airflow blockage due to fan failure or air passage obstruction.

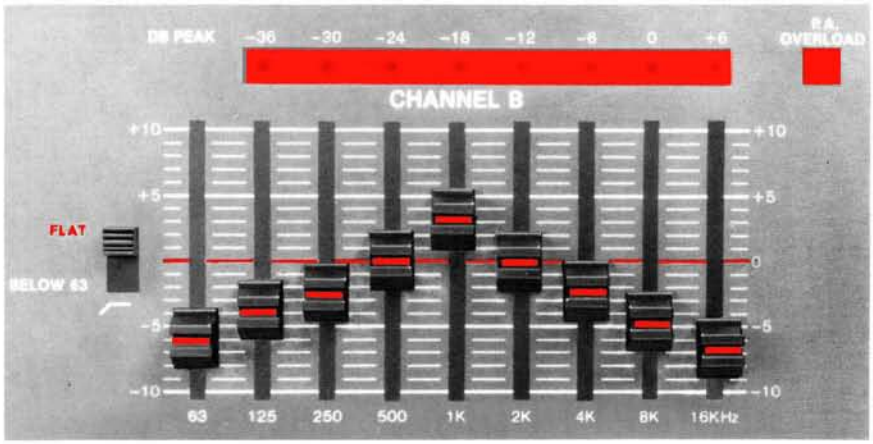




5 Stereo Headphones

A ¼-inch phone jack is available for connection to a pair of stereo headphones. The jack is wired to the A and B power amplifiers. The signal level to the headphones follows the A and B MASTER volume controls. The headphones allow the console to be used as a stereo mixer for tape recording. The speakers can be disconnected to avoid feedback.

6 DB PEAK Indicators



Are connected to power amplifier outputs and indicate peak output level. 0 DB PEAK equals approximately 25 watts to a 4-ohm load. A 6 dB change is a 4-times power change; therefore, −36 dB represents a 6 mW output and +6 dB a 100W output. These indicators are also used to provide an instantaneous readout of feedback frequency (see FEEDBACK FINDER). (Note that when the FEEDBACK FINDER is activated, the DB PEAK indicators for that channel are converted to frequency band indicators and do not indicate the signal level.)

7 PA (Power Amplifier) Overload Indicators

Light when the power amplifiers exceed approximately 1% distortion level (caused by clipping, overload, or any condition resulting in imperfect signal amplification). The indicator is sensitive to line voltage and speaker load conditions. The overload condition can generally be corrected by turning down the MASTER volume control. If the indicator remains on, the speaker load may be improper or a speaker cable may be shorted. It may remain on during SHUTDOWN activation. Under normal conditions, this indicator corresponds to a level of +9 dB on the DB PEAK indicator or 200 watts to a 4-ohm load.

8 Graphic Equalizers

Are two 10-band, fully combining, minimum-phase, octave type, normally connected to the power amplifier inputs. They provide 13 dB boost or cut at 63, 125, 250, 500 Hz, 1, 2, 4, 8, and 16 kHz, plus BELOW 63 Hz 12 dB/octave cutoff filters. The graphic equalizers permit adjustment of the sound system frequency response for a tonal balance appropriate to the performance and a reduction in the tendency toward feedback. They can also be used to adjust an audio playback system frequency response to compensate for variations in electrical and acoustical response that can alter the natural sound of the recorded material.

The graphic equalizers can also be used to produce disco-type sound by moderate amounts of low- and high-frequency boost.

Note that equalization by ear for proper sound quality requires a certain amount of skill and time. It is preferable to use a commercially available equalization analysis system such as the Shure M615AS Equalization Analyzer System, followed by feedback tuning using the built-in FEEDBACK FINDER and indicators (see next section). IMPORTANT: Don't overequalize! Too much equalization can result in unnatural and quite unpleasing sound.

No indicator is provided for either the 63 Hz filter control or BELOW 63 Hz filter switch; any low-frequency problems likely to be encountered can be easily removed by adjustment and listening tests. Reduce the 63 Hz equalizer or move the switch to BELOW 63 (⎍) if the sound is "boomy" or if extremely low-frequency noises such as "pop" or wind noise are causing power amplifier overload.

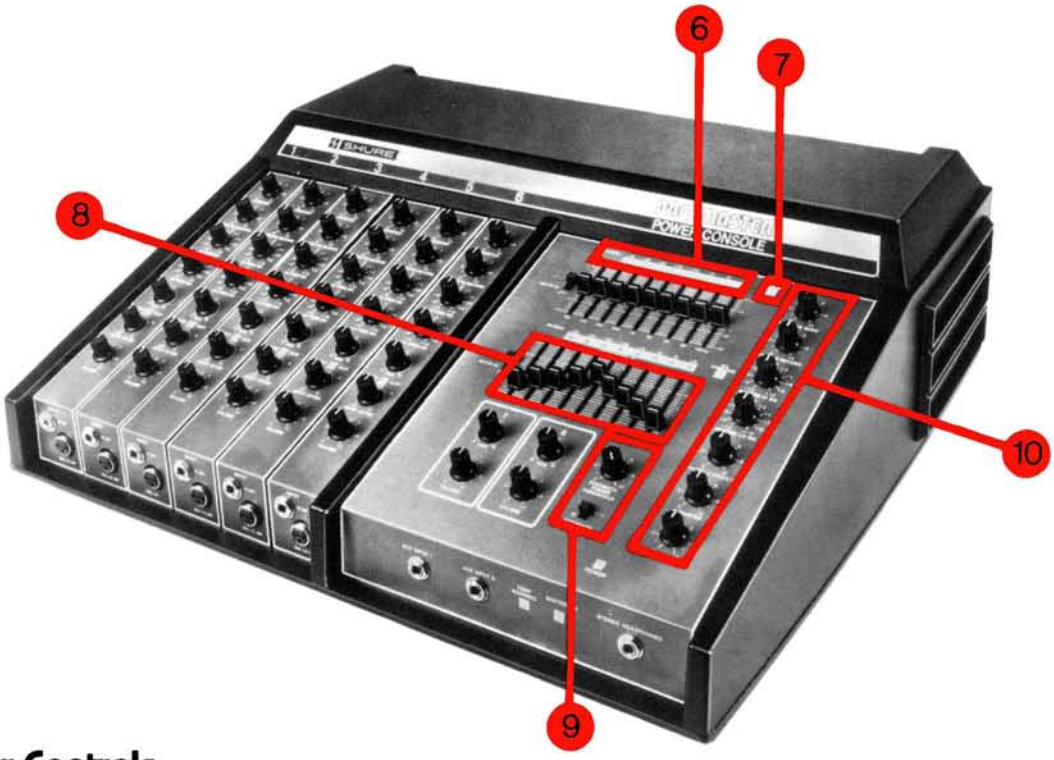
Since the graphic equalizer controls may overemphasize or remove desirable program material, you should minimize acoustic problems (including feedback) by careful microphone and speaker placement before equalizing.

9 FEEDBACK FINDER™

The FEEDBACK FINDER uses the LED indicators to provide a quick and easy means of determining the frequency (octave band location) of the most prominent feedback tones. The graphic equalizers can then be used to reduce the system response at these frequencies to suppress feedback. Connect all speakers and microphones and place them in their proper positions for the performance. Set master controls and individual input channel MONITOR, EFFECTS/REVERB and EQ controls to 0. Set all other individual input channel controls to the initial (orange mark) positions. Set the FEEDBACK FINDER switch to the desired output channel (A or B). The DB PEAK indicators for the channel selected are now connected for the feedback indicator function. Adjust the MASTER volume for that channel to just below feedback. If necessary, turn down the FEEDBACK FINDER THRESHOLD control from the 10 position to the point where room background noise does not light any DB PEAK indicators. Increase the MASTER volume until feedback just occurs and note the *highest* frequency band with a lit LED. Reduce the equalizer setting in this band until feedback stops. Repeat the last two steps until the feedback sound becomes a combination of a number of tones, or until one equalizer control has been set to −10. IMPORTANT: Don't overadjust the equalizer! Too much equalization can result in unnatural sound. With practice, the FEEDBACK FINDER can be used to equalize for feedback without subjecting the audience to ear-splitting feedback levels.

If operation is in the stereo mode, repeat the above procedure for the second channel, with the first channel turned off. When completed, perform a listening test using program material similar to the planned performance and, if necessary, make slight adjustments to the equalizers to provide the most pleasing sound.

When using one of the graphic equalizers for stage monitor speakers, feedback suppression of the monitor system is performed after the house system *and* with the main speakers off. The monitor speakers must be in their final operating positions relative to the microphones used. Use the same procedure as for the house system except use the individual MONITOR level and MONITOR MASTER controls for level adjustments. If more than one performer's microphone is involved, select the lead performer or center stage microphone for operation in the feedback suppression procedure. NOTE: During this procedure a person must stand in front of or hold (simulating a performer) the microphone being equalized. Since excessive low-frequency signals are not usually desirable for stage monitors, it may be advisable to set the equalizer FLAT/BELOW 63 switch of the monitor channel to BELOW 63, the 63 Hz control to −10, and the 125 Hz control to −5. Adjust the FEEDBACK FINDER THRESHOLD, MONITOR MASTER and EQualizer controls using the procedure previously described. Conduct a voice test and check for adequate level and intelligibility. Make a similar check of all other microphones being fed to the monitor system. Intelligibility may be improved if desired by a slight increase of equalizer controls in the 1 kHz to 4 kHz range, providing the desired level can be maintained without feedback. If feedback or ringing is encountered at any microphone location, try adjusting the position of and/or the distance to the nearest speaker.



10 Master Controls

Basically...

Monitor Master
Controls monitor mix level to MONITOR OUTPUT jack.

Reverb Return
Controls reverb level to A and B channel signal mixes.

Reverb HI EQ
Sets reverb signal treble boost or cut for desired tone shaping.

Reverb LO EQ
Sets reverb signal bass boost or cut for desired tone shaping.

Effects Send
Controls level of effects amplifier signal to EFFECTS OUTPUT jack.

A Master
Adjusts overall level of A channel mix. Controls level of A channel signals from mic inputs 1-6 and aux inputs 7 and 8 to all A channel and A+B outputs.

B Master
Adjusts level of B channel mix. Controls level of B channel signals from mic inputs 1-6 and aux inputs 7 and 8 to all B channel and A+B outputs.

In addition...

Monitor Master
Control precedes VOLUME and other channel controls. Only affected by INPUT ATTEN and channel MONITOR controls.

Reverb Return
This control follows the INPUT ATTEN, input VOLUME and EQ, and EFFECTS/REVERB channel controls, as well as the REVERB EQ controls. Not affected by the A/B PAN pots or MONITOR controls, or following master controls.

Reverb HI EQ
Adjusts master reverb signal high-frequency equalization on both A and B outputs. Does not affect MONITOR OUTPUT or EFFECTS OUTPUT.

Reverb LO EQ
Adjusts master reverb signal low-frequency equalization on A and B outputs. Does not affect MONITOR OUTPUT or EFFECTS OUTPUT.

Effects Send
Affected by channel INPUT ATTEN, EQ, VOLUME and EFFECTS/REVERB channel controls. Used for external effects or second monitor.

A Master
A/B mix to the A mix amplifier is controlled by the A/B PAN pot for each channel immediately preceding the A MASTER control. Does not affect signals added to COMmon MIX jacks or EQ and PA INPUTS.

B Master
A/B mix to the B mix amplifier is controlled by the A/B PAN pot for each channel immediately preceding the B MASTER control. Does not affect signals added to COMmon MIX jacks or EQ and PA INPUTS.

Controls • Connectors • Indicators (continued)
Power and Speaker Connections

11 Power ON-OFF Switch

Applies ac power to power supply (does not switch ac outlet).

12 Unswitched AC Grounded Outlet

Provides up to 100 watts of ac power to accessory equipment (mixer, tape recorder, lamp, etc.). The outlet is not fused and not switched; use the power switch on the accessory equipment. The outlet is not intended for use with high-power equipment such as power amplifiers.

13 AC Line Cord

Connect to ac power (120 Vac ± 10%, 50/60 Hz). Use only 16 AWG (or larger), three-wire extension cords. Console may draw up to 9 amperes (1100 watts) from ac supply circuit. May be operated from other voltages (see Service Manual).

14 10A, 250V Fuse

Protects console power supply against overload. (Replace only with identical size and type: 10A, 250V, type 3AB or ABC.)

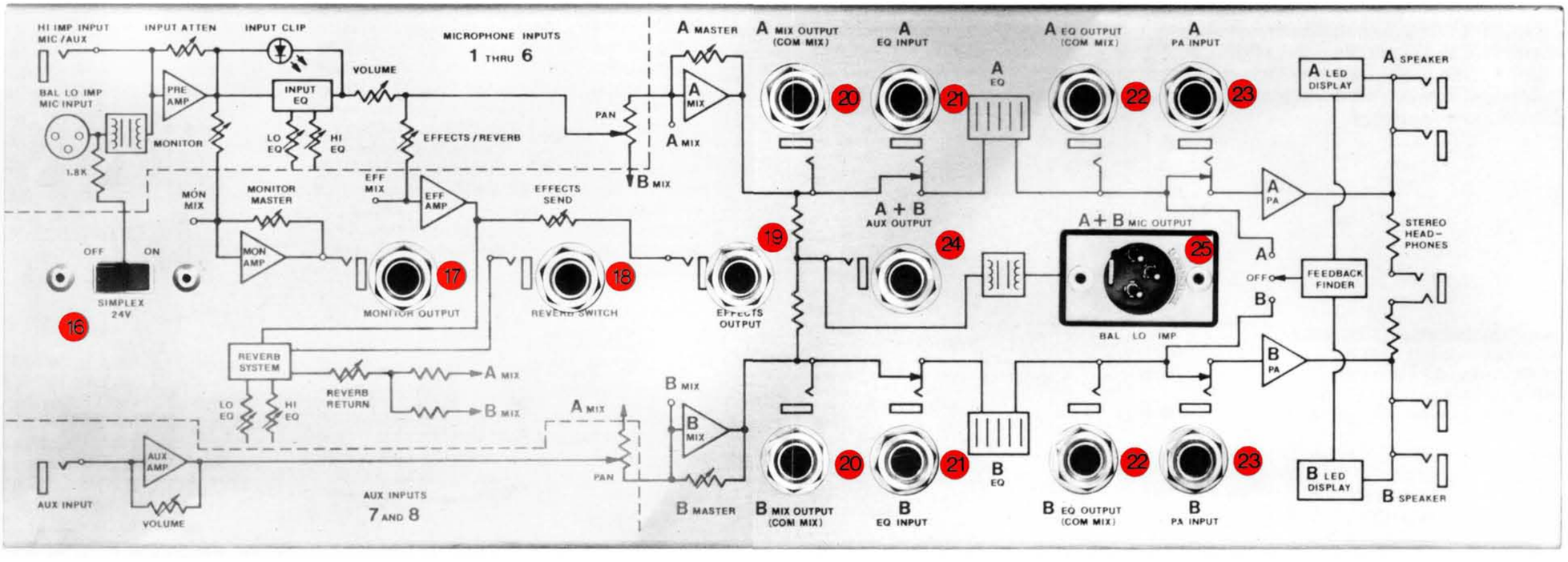
15 Speaker Outputs Jack (4)

Connect to speaker systems such as the Shure 701. Two parallel jacks are for PA (power amplifier) A and two are for PA B. Do not connect A and B SPEAKER OUTPUT jacks together as distortion and possible damage may result; for monophonic output, see SETUPS section. Remove and replace speaker jack cover when connecting speakers. Suggested speaker loads for each amplifier of the console include:

2—Shure Model 701 PRO MASTER™ Speaker Systems (8 ohms each), or
4—Shure Model 702 Stage Monitor Speaker Systems (16 ohms each), or
2—Shure Model 703 PRO MASTER™ Stage Monitors (8 ohms each), or
4—Shure Model SR102 or SR103 Speaker Columns (16 ohms each), or
2—Shure Model SR112 or SR116 Compact Speaker Systems (8 ohms each).

Connecting too many speakers to either or both output jacks may result in a combined load below the 4-ohm minimum. Operation with such a load may cause an excessively high internal temperature (TEMP WARNING LED turns on), or the PA (power amplifier) OVERLOAD LED may turn on at lower than normal levels (before the +6 dB LED). Note that no damage will result; the console is protected against speaker overloads and shorts. Also, the console may be operated without speakers (with headphones) for tape recording.

PATCH BLOCK™ Rear Panel



16 Simplex 24V Switch

Turn on when powering low-impedance condenser microphones from the console; turn off when not used. Balanced low-impedance microphones may be used in combination with condenser microphones. NOTE: Do not turn on when using *unbalanced* low-impedance microphones. The built-in 24 Vdc simplex voltage is applied to input channels 1 through 6 BAL LO IMP connectors to power most condenser microphones. Make sure the microphone(s) will operate properly with 24 Vdc open-circuit voltage and a 1.8k powering resistor.

17 Monitor Output Jack

Provides unbalanced line level output (intended for connection to unbalanced auxiliary or line bridging inputs) for separate monitor amplifier system. Output (pre-fader) precedes channel VOLUME, EQualization, EFFECTS/REVERB and PAN controls. Adjust individual channel MONITOR controls for desired mix, and MONITOR MASTER control for overall level. Connect to A or B PA (power amplifier) INPUT or EQualizer INPUT to use console power amp or graphic equalizer for monitor, or connect to external power amplifier.

18 Reverb Switch Jack

Provides for connection of remote reverb footswitch; reverb channel and master controls can be preset and added by performers when needed. Switch closure acts the same as turning down the REVERB RETURN control, disabling the reverb. Footswitch cable need not be shielded.

19 Effects Output Jack

Connect to external effects devices such as echo, delay, flanger, or phase shifter input. Affected by channel INPUT ATTEN, VOLUME, EQ and EFFECTS/REVERB controls, and master EFFECTS SEND control. Connect effects device output (return) jack to AUX INPUT 7 or 8. Aux channel VOLUME control becomes effects return control. EFFECTS OUTPUT jack may be used as second (post-fader) monitor by connecting to external power amp or console A or B PA (power amplifier) or EQ INPUT.

20 A, B Mix Output Jacks

These COMmon MIX (output-input) jacks provide a post-MASTER volume, pre-graphic equalizer output or input for picking off the A or B mix for insertion into tape recorders or other power amplifiers, or inserting external signals from other PRO MASTER™ consoles. The A and B channels may be combined (mono mix) at this point by connecting these jacks together.

21 A, B EQ Input Jacks

Provide for insertion of signals from MONITOR or EFFECTS OUTPUT from the console or from an external mixer, at the same time disconnecting the normal signal in that channel. The inserted signal will be affected by the graphic equalizer, but not by the MASTER volume control. If there is no connection at the PA INPUT, the inserted signal passes to the power amplifier, and the graphic equalizer and power amplifier are used for the monitor or effects system. Inserted signal is not affected by any PRO MASTER volume controls, so console should be turned off when connecting external equipment to these jacks.

22 A, B EQ Output Jacks

These COMmon MIX (output-input) jacks provide for picking off the equalized signal for connection to a tape recorder or another power amplifier, or insertion of signals from other PRO MASTER consoles in addition to the existing equalized signal. Inserted signal is not affected by any console controls.

23 A, B PA Input Jacks

Provide for insertion of signals into power amplifier from console outputs (MONITOR, EFFECTS, etc.), at the same time disconnecting the normal signal in that channel. Inserted signal is not affected by any PRO MASTER console controls, so console should be turned off when connecting external equipment to these jacks.

24 A + B AUX Output Jack

Provides aux level mixed A+B (monophonic) signal to tape recorder, other mixer or amplifier, or house sound system. Mixed signal is pre-graphic equalizer and affected by all other A and B console controls. Jack may be connected to EQ or PA INPUT jack for mixed output on A or B power amplifer.

25 A + B MIC Output Jack

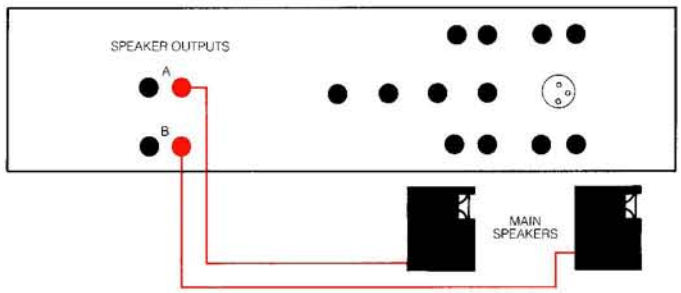
Provides balanced, low-impedance, microphone-level mixed A+B (monophonic) signal to tape recorder or house sound system when used in conjunction with built-in systems. Allows PRO MASTER console to be used for mixing, monitoring or recording. Connect to low-impedance microphone input jack. Mixed signal is pre-graphic equalizers and is affected by all other A and B controls.

Setups

The PRO MASTER™ is an extremely versatile unit. Its great flexibility is in part achieved by the many PATCH BLOCK™ (rear panel) inputs and outputs which permit its use in a wide variety of applications. The setups described in this section offer some idea of the varied applications of the PRO MASTER. Use only high-quality, shielded patch cords for patching. Turn PRO MASTER power switch off when making patch connections to avoid possible high-level transients, noise and hum.

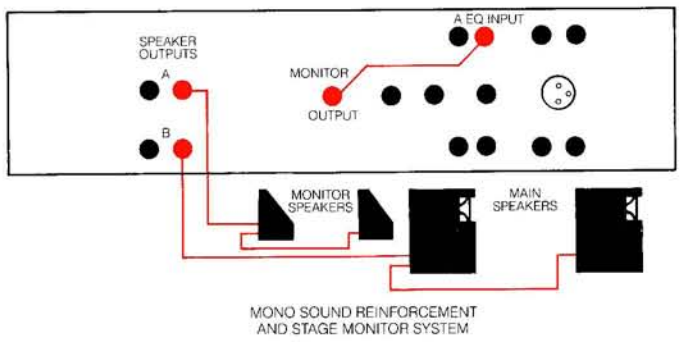
Monophonic Sound Reinforcement (See Setup 1.) No rear panel patching is required. Plug in the microphones and left (A) and right (B) speakers, and set the operating controls as desired. Adjust the PAN pots to the center (orange mark) position.

Stereo Sound Reinforcement (See Setup 1.) Same as for monophonic, except adjust PAN pots so that the microphone inputs are routed to the desired output channel: left (A) and right (B), or to both channels (orange mark) simultaneously for center stage inputs.



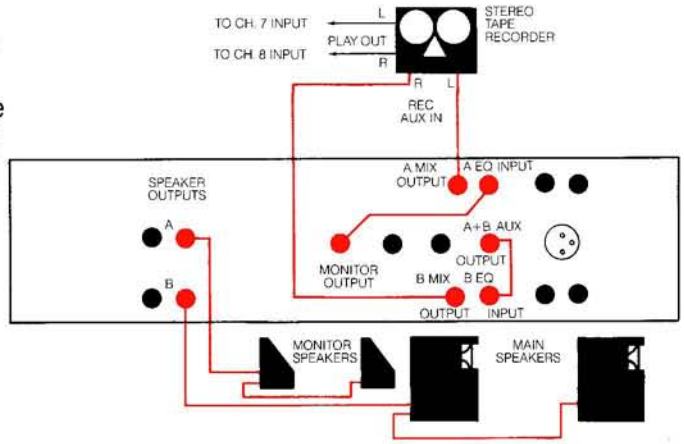
SETUP 1

Mono Sound Reinforcement and Stage Monitor System (See Setup 2.) Patch the MONITOR OUTPUT jack to the A EQ INPUT jack. Connect the monitor speaker(s) to channel A SPEAKER OUTPUTS and the main speakers to channel B. Note that the monitor system is equalized by the channel A graphic equalizer; if equalization is not desired, the MONITOR OUTPUT can be patched to the channel A PA (power amp) INPUT jack instead of the EQ INPUT. Individual channel MONITOR controls set the mix and level to be fed to the monitor system. The MONITOR MASTER adjusts the overall monitor system level. Adjust the channel B MASTER and graphic equalizer for the main speakers. Adjust the PAN pots to the center (orange mark) position.



SETUP 2

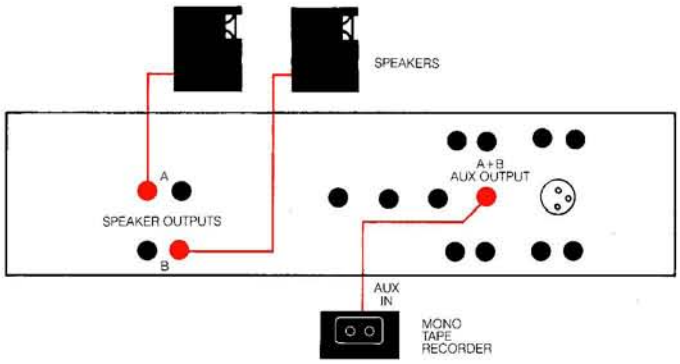
Mono Sound Reinforcement, Stage Monitor, and Stereo Tape Record/Playback (See Setup 3.)
Patch the MONITOR OUTPUT jack to the A EQ INPUT jack.Patch the A+B AUX OUTPUT jack to the B EQ INPUT jack. Connect the A MIX OUTPUT jack to the left channel aux input of the tape recorder, and the B MIX OUTPUT to the right channel aux input. Connect the monitor speaker(s) to channel A SPEAKER OUTPUTS and the main speakers to channel B. Adjust the MONITOR MASTER and channel A graphic equalizer for the monitor speakers. Adjust the channel A and B MASTER volume controls *simultaneously* to control the main speakers and tape recorder. The channel B graphic equalizer is for the main speakers. For tape playback, connect the tape recorder outputs to AUX INPUT 7 and 8.



MONO SOUND REINFORCEMENT, STAGE MONITOR, AND STEREO TAPE RECORD/PLAYBACK

SETUP 3

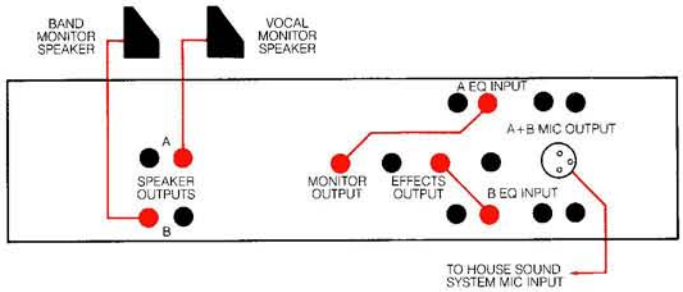
Mono or Stereo Sound Reinforcement and Mono Tape Record (See Setup 4.)
Connect left and right speakers to the A and B SPEAKER OUTPUTS. Connect the A+B AUX OUTPUT to the tape recorder aux input jack.



MONO OR STEREO SOUND REINFORCEMENT AND MONO TAPE RECORD

SETUP 4

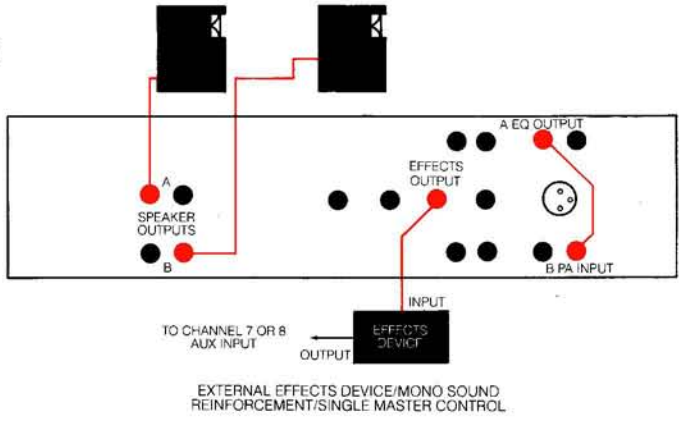
Two Monitors and Mono "House" Sound System (See Setup 5.)
When a "house" system is to be used as the prime sound system, the PRO MASTER can be used as the system mixer, and also provide two monitor outputs as follows. Patch the MONITOR OUTPUT jack to the A EQ INPUT jack, and the EFFECTS OUTPUT jack to the B EQ INPUT jack. Connect the A+B MIC OUTPUT to the house system mic input. Connect SPEAKER OUTPUTS A to vocal monitor speakers and SPEAKER OUTPUTS B to band monitor speakers. Adjust MONITOR controls for vocal monitor and adjust EFFECTS controls for band monitor. Note that the vocal monitor is pre-fader and the band monitor is post-fader.



TWO MONITORS AND MONO "HOUSE" SOUND SYSTEM

SETUP 5

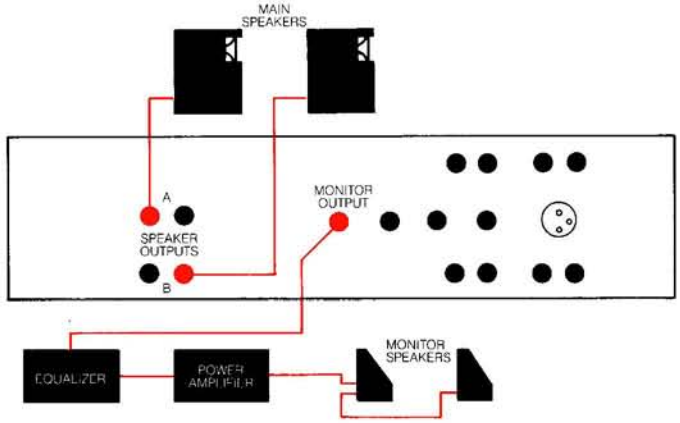
External Effects Device/Mono Sound Reinforcement/Single Master Control (See Setup 6.)
Connect the EFFECTS OUTPUT jack to the input of the external effects device (echo, flanger, etc.), and the effects device output to a channel 7 or 8 AUX INPUT jack. Adjust the channel 7 or 8 PAN pot to center. Patch the A EQ OUTPUT jack to the B PA INPUT jack. Both power amplifiers are fed by the channel A MASTER and graphic equalizer, and both SPEAKER OUTPUTS provide the same signal at 200 watts to 4 ohms.



EXTERNAL EFFECTS DEVICE/MONO SOUND REINFORCEMENT/SINGLE MASTER CONTROL

SETUP 6

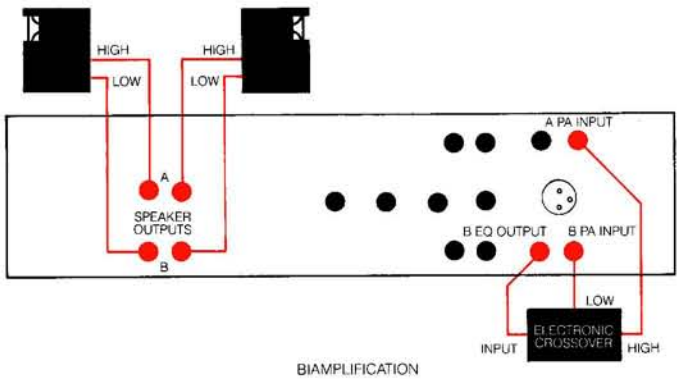
Separate Monitor Equalizer and Power Amplifier (See Setup 7.)
When the A and B SPEAKER OUTPUTS are in use (and each requires its own graphic equalizer) and a separate monitor system is desired, connect the MONITOR OUTPUT jack to the input of a separate equalizer (such as a Shure SR107). Connect the equalizer output to a separate power amplifier (such as a Shure SR105B) and connect monitor speakers. The monitor system is only affected by the PRO MASTER INPUT ATTEN, MONITOR, and MONITOR MASTER controls.



SEPARATE MONITOR EQUALIZER AND POWER AMPLIFIER

SETUP 7

Biamplification (See Setup 8.)
To provide a monophonic biamped output to two-way speaker systems such as the Shure 701, connect the B EQ OUTPUT to the input of an electronic crossover (such as the Shure SR106). Connect the crossover high-frequency output to the channel A PA INPUT, and the low-frequency output to the channel B PA INPUT. Connect the SPEAKER OUTPUTS A to the speaker high-frequency input jack and the SPEAKER OUTPUTS B to the speaker low-frequency input jack. (Refer to the speaker system data sheet for biamping modification instructions.)
Note that the output channel A MASTER and graphic equalizer are not operative; the channel B MASTER and graphic equalizer adjust the output signal to the speakers.



BIAMPLIFICATION

SETUP 8

Operation

1. Position the microphones and connect them to the PRO MASTER™. Use both inputs on each channel if more than six microphones are to be connected. Use low-impedance microphones and cables to minimize loss and interference if long microphone cable lengths are needed.
2. Position the speakers and connect them to the PRO MASTER. Make sure the combined speaker load is not less than 4 ohms on each channel. Use minimum cable lengths to maximize output power. Use the proper cable size for the required length.
3. Make any rear-panel patching connections required (refer to *SETUPS* section). All patching connections except the A+B MIC OUTPUT are standard two-conductor, ¼-inch phone jacks.
4. Connect any external effects device to the PRO MASTER EFFECTS OUTPUT and AUX INPUT jacks. Power for the external effects device can be obtained from the PRO MASTER rear-panel UNSWITCHED AC receptacle (100 watts maximum).
5. Connect the PRO MASTER line cord to an ac source capable of supplying 1100 watts. If extension cords are required, make sure they are 16 AWG or larger.
6. Make sure the PRO MASTER air louvers are not blocked. Check to make sure the air filter is clean.
7. In low ambient light conditions, a high-intensity, low-wattage lamp (not supplied) can be plugged into the rear-panel UNSWITCHED AC receptacle (100 watts maximum).
8. Set the front-panel controls to their initial settings (orange marks). Set the INPUT ATTEN controls for the usage on each input. Turn on the rear-panel power ON-OFF switch.
9. Adjust the A and B MASTER volume controls to the desired level. Using program material similar to the actual performance, adjust the PAN, MONITOR, EFFECTS/REVERB and EQ controls as desired for the most pleasing sound.
10. Using the FEEDBACK FINDER™, set the equalizers for the highest feedback-free sound level. The equalizer controls can then be "touched up" for most pleasing sound.
11. During operation, observe the various LED indicators for possible setting corrections:
    A. **INPUT CLIP**—If on constantly, use the INPUT ATTEN to reduce the input signal and eliminate the distortion. (Set for occasional flashing.)
    B. **DB PEAK**—Observe action to monitor output power level and channel balance.
    C. **PA OVERLOAD**—If on constantly, reduce volume and/or check speaker load.
    D. **TEMP WARNING**—Check for air blockage, dirty air filter, shorted speaker cable or excessive heat near the console.
    E. **SHUTDOWN**—Check for excessive console heating or cooling fan failure.

Maintenance

The PRO MASTER is an exceptionally well-designed unit. All components are of the highest quality, operating well within their respective ratings to assure long life. The following list of Do's and Don'ts describes minimal operating precautions and maintenance to provide years of dependable service.

- DO clean the air filter every 100 hours of operation (more frequently in dusty or dirty areas). Stand the console on its rear bumpers, remove the screw securing the filter, and slide it out of its slot. Rinse the filter in water or a mild detergent solution, allow to dry, and replace.
- DO unplug the console before cleaning. DO clean the outer surfaces of the console with a clean, damp cloth and mild detergent. DON'T use strong solvents or cleaning fluids.
- DO use a 16 AWG or larger heavy-duty extension cord when additional line cord length is needed.
- DON'T operate the console with air louvers blocked, or placed on a radiator or heat-producing equipment. Avoid operation in direct, hot sunlight.
- DON'T replace the rear-panel fuse with a different size or type. Use only 10A, 250V, type 3AB or ABC.
- DON'T connect the A and B speaker outputs together (see text for monophonic setups).
- DON'T risk fire or shock hazard by operating the console in rain.
- DON'T use *unbalanced* low-impedance microphones with the SIMPLEX 24V switch on; turn off the switch if not required for powering condenser microphones. If simplex power is in use, connect unbalanced low-impedance microphones through a line matching transformer (Shure A95FP) to a HI IMP INPUT.

Troubleshooting

Should any difficulty be encountered in console operation, the problem can often be traced to some simple source such as an error in interconnection. The following is offered as a basic guide to this type of problem.

Troubleshooting

Symptom	Probable Cause or Correction
Console is "dead" (no output, POWER LED off)	1. Check that ac power source is "live" and that console is plugged in. 2. Check that power ON-OFF switch is on. 3. Check that rear-panel fuse (10A, 250V) is good.
Console appears to be overheating (TEMP WARNING LED on)	1. Check air louvers for blockage. 2. Check for proper speaker load or shorted speaker cable. 3. Check air filter and clean if necessary.
Console power amplifiers turn off and remain off (SHUTDOWN LED on)	1. Turn MASTER controls down for one minute to allow proper cooling. 2. Turn console off for a few seconds and turn back on. 3. If shutdown persists, have console checked by qualified service personnel.
No signal at speaker (all console functions appear normal)	1. Check for defective or improperly connected speaker cables. 2. Check for improper connections to EQ or PA INPUT jacks. 3. Check settings of channel VOLUME and MASTER volume controls.
Console fuse blown	1. Replace with identical fuse (10A, 250V, type 3AB or ABC). 2. If second fuse blows, have console checked by qualified service personnel.
One of two inputs on same channel not working properly (both ¼-inch and 3-pin jacks in use)	1. Make sure similar microphones are used on both inputs, and microphone impedances match the inputs used. 2. Make sure microphone is not used with accessory equipment on other input. 3. Make sure both microphone switches are on.
INPUT CLIP LED flashing	1. Adjust INPUT ATTEN to reduce channel input level. 2. Reduce input signal level at source.
PA OVERLOAD LED flashes while DB PEAK indicators read less than +6	1. Check for defective (shorted) speaker cable. 2. Check that load impedance is not too low (too many speakers are connected).
Loud noise clicks when certain microphones or cables are used	1. SIMPLEX 24V switch is on (when not needed). 2. Unbalanced cable used when SIMPLEX 24V switch is on. 3. Check for defective microphone cables.
No monitor output (program output normal)	1. Check monitor output connection to EQ or PA INPUT, or external amplifier. 2. Make sure MONITOR and MONITOR MASTER controls are turned up. 3. Monitor speaker volume control (if present) turned down.
Sound quality poor (weak or thin)	1. Excessive equalization on graphic equalizers. 2. Defective input or patching cables.

Specifications

Type: Solid-state stereo power console using discrete components and integrated circuits
Inputs: Eight input channels: six high- and/or balanced low-impedance mic inputs, plus two aux inputs
Graphic Equalizers: Two 10-band, fully combining, minimum-phase, octave type, normally connected to power amplifier inputs; 13 dB boost or cut at 63, 125, 250, 500 Hz, 1, 2, 4, 8 and 16 kHz; BELOW 63 Hz 12 dB/octave cutoff filters (10 dB down at 31 Hz)

Power Output:	**Both channels driven**	**One channel driven**
Per channel/4 ohms	200W min.	240W typical
Per channel/8 ohms	125W min.	145W typical

Measured at 1 kHz, 120 Vac, 1% THD
Distortion: THD typically less than 0.1% at 40 Hz and 1 kHz, 0.25% at 15 kHz, IM distortion typically less than 0.25% (One channel driven, 180W or less to 4 ohms, 110W or less to 8 ohms, measured from low-impedance input with individual and master controls at typical settings)
Low- and High-Frequency
Input Equalization: ±13 dB at 100 Hz and 10 kHz
Input Clipping Indicators: Light 3 dB below input or equalizer clipping level
DB Peak Indicators: Indicate power amplifier peak voltage; +6 dB LED indicates 100 watts sine-wave output to 4-ohm load
PA Overload Indicators: Light when power amplifier THD exceeds 1%; fully on at 5%

Input Sensitivity: (full power output)		
	BAL LO IMP	0.6 mV
	HI IMP	8 mV
	AUX	215 mV
	EQ INPUT	960 mV
	PA INPUT	960 mV

Input Clipping Level:
BAL LO IMP 700 mV to 21 mV (INPUT ATTEN −30 to 0)
HI IMP 10V to 335 mV (INPUT ATTEN −30 to 0)
AUX 30V to 10V (VOLUME from 0 to 10)
Voltage Gain:
94 dB BAL LO IMP INPUT to SPEAKER OUTPUTS
71 dB HI IMP INPUT to SPEAKER OUTPUTS
43 dB AUX INPUT to SPEAKER OUTPUTS
64 dB BAL LO IMP INPUT to MIX OUTPUT
77 dB BAL LO IMP INPUT to MONITOR OUTPUT
74 dB BAL LO IMP INPUT to EFFECTS OUTPUT
16 dB BAL LO IMP INPUT to A+B MIC OUTPUT
58 dB BAL LO IMP INPUT to A+B AUX OUTPUT
81 dB BAL LO INPUT to HEADPHONE OUTPUT
0 dB EQ INPUT to EQ OUTPUT
30 dB PA INPUT to SPEAKER OUTPUTS

Levels and Impedances:

Circuit	**Nominal Level**	**Maximum Level**	**Actual Impedance**	**Working Impedance**
BAL LO IMP INPUT	5 mV	700 mV	1k	19-300 ohms
HI IMP INPUT	50 mV	10V	145k	100k or less
AUX INPUT	0.5V	30V	50k	10k or less
MIX OUTPUT	1V	9V	2.4k	2k or more
EFFECTS OUTPUT	1V	9V	2.4k	2k or more
MONITOR OUTPUT	1V	9V	2.4k	2k or more
EQ INPUT	1V	10V	50k	10k or less
EQ OUTPUT	1V	9V	2.4k	2k or more
A+B AUX OUTPUT	1V	9V	5k	2k or more
A+B MIC OUTPUT	5 mV	75 mV	70 ohms	19-300 ohms
PA INPUT	1V	10V	50k	10k or less
SPEAKER OUTPUT	—	28.3V	—	4 ohms or more
HEADPHONES	—	10V	360 ohms	4 ohms or more

Frequency Response: ±2 dB, 40 to 20,000 Hz, BAL LO IMP INPUT to SPEAKER OUTPUTS
Hum and Noise: (20 Hz to 20 kHz) −127 dBV equivalent input noise (BAL LO IMP)
Noise: (300 Hz to 20 kHz) −128 dBV equivalent input noise (BAL LO IMP)

Signal-to-Noise Ratio: Greater than 80 dB (below full output) at typical control settings (orange marks, MASTER at 5, INPUT ATTEN at −12)
Mic Input Simplex Power: 24 Vdc open-circuit, 1.8k series resistance
Power Requirements: 120 Vac ±10%, 50/60 Hz; 1100W max. (For other voltages, see Service Manual)
Environmental Conditions
Operating: −7° to 43°C (20° to 110°F)
Storage: −40° to 74°C (−40° to 165°F)
Overall Dimensions: 190 mm H x 584 mm W x 508 mm D (7½ in. x 23 in. x 20 in.)
Weight: 21.3 kg (47 lbs.)

Speaker Systems Recommended for your PRO MASTER™

Model 701 PRO MASTER Speaker System

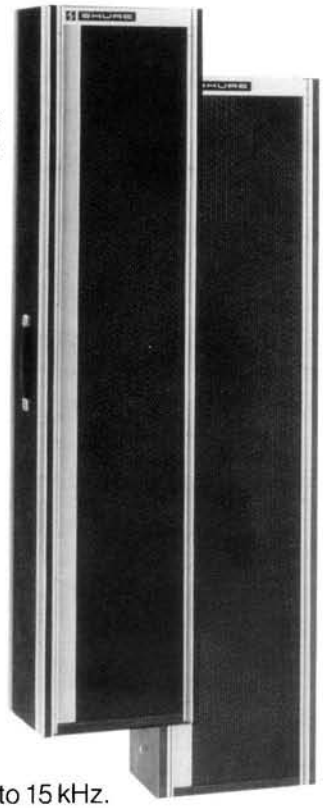
A wide-range, high efficiency, lightweight, portable, two-way speaker system—an ideal companion to the Model 700 PRO MASTER Power Console. The Model 701 provides high SPL sound reinforcement of wide frequency range program material in every location from the largest auditoriums to the most intimate clubs. The speaker system consists of a 15-inch woofer in a front-ported bass reflex cabinet, and a high-frequency horn and driver combination with adjustment for either a 60° or 120° horizontal horn dispersion angle. Easily biamped. Maximum recommended amplifier output to 8 ohms: 150 watts continuous. Frequency response: 50 Hz to 15 kHz. Impedance: 8 ohms.

Model 703 PRO MASTER Stage Monitor

This is a rugged, professional, two-way monitor system designed for years of hard on-stage use. It has two 8-inch speakers and a high-frequency driver coupled to a 120° radial horn. Horn dispersion angle may be reduced to 60° for tighter control of foldback signal. Can be positioned at 30° or 60° angle to the stage. Maximum recommended amplifier output: 100 watts continuous to 8 ohms. Frequency response: 100 Hz to 16 kHz. Impedance: 8 ohms.

Model 702 Stage Monitor Speaker System

A compact, high-quality, two-way speaker system designed for localized sound coverage in on-stage monitor (foldback) applications. The 702 may be used with virtually any power amplifier capable of delivering up to 50 watts to a 16-ohm load. It can be placed in either of two slanted positions facing the performer. Built-in volume control. Frequency response: 100 Hz to 20 kHz. Impedance: 16 ohms.



Model SR102 and SR103 Speaker Columns

Outstanding performance in sound reinforcement systems. These columns have a wide frequency range, distortion-free reproduction and high sound penetration power. Model SR102 is designed for portable use and Model SR103 for permanent installation. Power rating: 100 watts maximum to 16 ohms. Frequency response: 100 Hz to 15 kHz. Impedance: 16 ohms.

Model SR112B, SR112W and SR116B Compact Speaker Systems

Compact, rugged and heavy-duty, these small, wide-range speaker systems are perfect for studio monitor and club applications. They feature wide frequency response, low distortion and smooth dispersion characteristics, and are designed to operate with amplifiers delivering up to 100 watts to an 8-ohm load. The SR112B and SR112W are designed for permanent installation (SR112W is woodgrain finish), and the SR116B is portable for temporary installations. Frequency response: 45 Hz to 16 kHz. Impedance: 8 ohms.

Accessories

Model SR106 Electronic Crossover

A selectable-frequency dividing network (500, 800, 2600 Hz), designed for use with two- or three-way speaker systems such as the Model 701 in high-quality sound systems. It uses the principle of biamplification to separate an audio console or mixer-preamplifier output into two frequency bands for distribution to separate power amplifiers. The SR106 has both professional three-pin and phone jack inputs and outputs. Occupies only 1¾-inch of rack space. Combined frequency response: flat ±2 dB, 20 to 20,000 Hz.

A95 Series Line Matching Transformers

Adapt high-impedance microphone to low-impedance console inputs, and low-impedance microphone to high-impedance inputs. Model A95FP plugs directly into console input.

Model A7C Console Cover

Made of rugged, reinforced vinyl, this useful accessory protects against weather and scrapes. Zippered closures permit quick setups and takedowns. Front cutout provides for carrying handle use.

Model A7S Console Stand

This handsome, sturdy unit makes a convenient support when a table or desk is not available. Made of durable steel tubing, it is quickly and easily set up and taken down.

Guarantee

This Shure product is guaranteed in normal use to be free from electrical and mechanical defects for a period of one year from date of purchase. Please retain proof of purchase date. This guarantee includes all parts and labor. This guarantee is in lieu of any and all other guarantees or warranties, express or implied, and there shall be no recovery for any consequential or incidental damages.

Service

If information or service should be required, contact your local Shure PRO MASTER™ dealer explaining your difficulty in detail. In addition, the Shure factory service department will be ready to assist you immediately upon request.

Shipping Instructions

Carefully repack the unit and return it prepaid to:

Shure Brothers Incorporated
Attention: Service Department
1501 West Shure Drive
Arlington Heights, Illinois 60004

If outside the United States, return the unit to your dealer or Authorized Shure Service Center for repair. The unit will be returned to you prepaid.

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